im Vertrieb von

CAMBOARD Electronics

Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

CAUTION *Do not connect this device to a computer data or telecommunications network*

TP Transmitters and Receivers

HIgh Resolution Video, Composite Video, and Stereo Audio Twisted Pair Cable Transmission Products

68-754-01 **Rev. A**
Printed in the USA
12 02

www.extron.com

Extron Electronics, USA
1230 South Lewis Street
Anaheim, CA 92805
USA
714.491.1500
Fax 714.491.1517

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands
+31.33.453.4040
Fax +31.33.453.4050

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Building
Singapore 368363
+65.6383.4400
Fax +65.6383.4664

Extron Electronics, Japan
Daisan DMJ Building 6F
3-9-1 Kudan Minami
Chiyoda-ku, Tokyo 102-0074 Japan
+81.3.3511.7655
Fax +81.3.3511.7656

© 2002 Extron Electronics. All rights reserved.

www.camboard.de
Tel. 07131 911201
Fax 07131 911203
ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), or 65.383.4400 (Asia) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

Quick Start Guide — IN1124/1128/1130 Transmission System

Step 1

Turn the equipment off and disconnect the equipment from the power source.

Step 2

If desired, rack mount the transmitter. Use the optional 1U rack-mount shelf, part #**IN9080**, for rack mounting.

Step 3

If desired, furniture mount the receiver. Use the optional mounting brackets, part #**IN9089**, to mount the receiver to any flat surface.

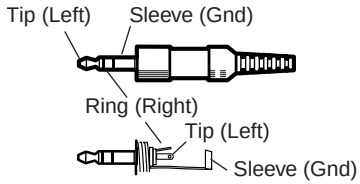
Step 4

Video input — Connect the VGA-UXGA RGBHV, RGBS, RGsB video input to the 15-pin HD Input connector on the transmitter.

Step 5

Audio input — Connect a PC audio source (such as a computer or a CD player) to the 3.5 mm mini stereo audio connector for unbalanced audio input on the transmitter. See the figure below for wiring.

NOTE *Input only analog, line level, audio signals on the audio input connector.*



Step 6

Local monitor video output — If desired, connect a local monitor or other device to this 15-pin HD female connector on the transmitter for a buffered output.

Step 7

Local audio output — If desired, connect the PC audio output on this 3.5 mm stereo jack on the transmitter to local powered speakers.

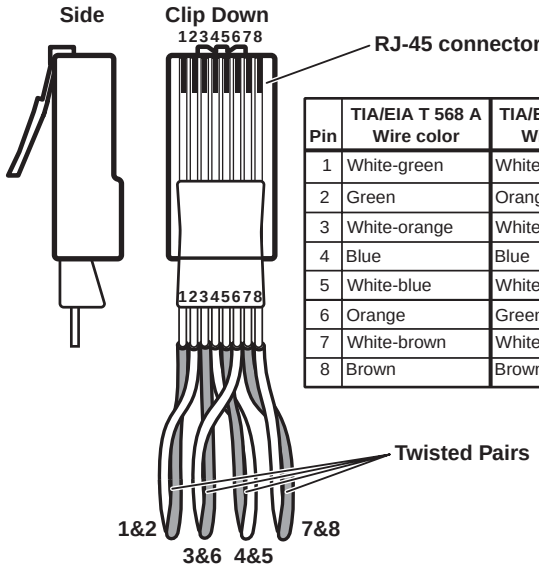
Step 8

Transmitted signal cabling — Connect up to 4 or 8 Extron skew-free A/V or CAT 5 (minimum) cables, terminated with RJ-45 connectors, between the transmitter and all receivers. Terminate the cables in accordance with the TIA/EIA T 568A or TIA/EIA T 568B wiring standards. You can use either standard, but use the same standard on both ends of the cable. See the figure on the next page for wiring.

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

Quick Start Guide — IN1124/1128/1130 Transmission System, cont'd



Pin	TIA/EIA T 568 A Wire color	TIA/EIA T 568 B Wire color	Signal
1	White-green	White-orange	Red/V. sync+
2	Green	Orange	Red/V. sync-
3	White-orange	White-green	Green/H. sync+
4	Blue	Blue	Blue+
5	White-blue	White-blue	Blue-
6	Orange	Green	Green/H. sync-
7	White-brown	White-brown	Mono audio +
8	Brown	Brown	Mono audio -

Step 9

Video outputs — Connect the desired video devices to the Output 15-pin HD connectors on each receiver.

Step 10

Audio outputs — Connect the desired audio devices, such as local powered speakers, to these 3.5 mm jacks on each receiver. The output is mono.

Step 11

AC power — Plug the external 9V power supply into the power connector on the transmitter and all receivers. Plug the power supplies into a 100 to 240VAC, 50 Hz or 60 Hz power source. Each unit has a power LED that indicates that power is applied.

Alternatively, an Extron P/S 100 Universal 12VDC Power Supply can power up to six transmitters or receivers using only one AC power connector.

Step 12

Sharpness control — Adjust the sharpness of both output images from each receiver by using a Tweeker or other small, flat-head, screwdriver to adjust the control.

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

Table of Contents

Chapter 1 • Introduction 1-1
- **About this Manual** 1-2
- **About the Transmitter/Receiver System** 1-2
  - TP cable advantages 1-2
  - System distribution 1-2
  - Transmission distance 1-2
- **About the TP Transmitter/DAs** 1-3
- **About the TP Receiver** 1-4
- **Features** 1-4
  - IN1124 TP transmitter/distribution amplifier 1-4
  - IN1128 TP transmitter/distribution amplifier 1-5
  - IN1130 TP receiver 1-5

Chapter 2 • Installation and Operation 2-1
- **Installation Overview** 2-2
- **Rack Mounting the Transmitter** 2-2
- **Furniture Mounting the Receiver** 2-3
- **Transmitter Cabling** 2-4
- **Transmitted Signal Cabling** 2-6
  - Termination of TP cable 2-6
  - Cable testing 2-7
  - Equalizing pair skew 2-8
- **Receiver Cabling** 2-9
- **Operation** 2-10
- **Troubleshooting** 2-10

Appendix A • Reference Information A-1
- **Specifications** A-2
- **Included Parts** A-5
- **Suggested Accessories** A-6
- **Cables/Adapters** A-6

68-754-01 **Rev. A**
Printed in the USA
12 02

All trademarks mentioned in this manual are the properties of their respective owners.

im Vertrieb von CAMBOARD Electronics

Chapter One

Introduction

Introduction

Features

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

About this Manual

This manual documents the installation, features, and operation of the Extron IN1124 and IN1128 TP twisted pair (TP) transmitters/distribution amplifiers (referred to in this manual as "transmitters" or "transmitter/DAs") and the IN1130 TP receiver (referred to in this manual as a "receiver").

About the Transmitter/Receiver System

The Extron IN1124 and IN1128 transmitters and IN1130 receivers provide a system for long-distance distribution of computer (RGBHV or RGBS) video and mono audio over Extron's skew-free A/V UTP cable or over CAT 5 unshielded twisted pair (UTP), shielded twisted pair (STP), or foil shielded twisted pair (FTP) cable. With adapter cables, the system can also distribute component video or S-video and/or composite video.

TP cable advantages

Extron's skew-free cable or CAT 5 cable is a fraction of the size of coaxial cable, as well as being much lighter, more flexible, and far less expensive. These TP products make cable runs simpler and less cumbersome. Termination of the cable with RJ-45 connectors is simple, quick, and economical.

System distribution

The transmitters split and buffer the transmitted signal four (IN1124) or eight (IN1128) times. The receivers each have two RGBHV and audio outputs. With this combination of a transmitter/DA with a local monitor and four or eight buffered receivers, the input signal can be widely distributed.

Transmission distance

The minimum reliable transmission distance between transmitters and receivers is 50 feet. The maximum distance is determined by the output frequency and resolution. The table on the following page specifies the recommended maximum transmission distances using Extron skew-free A/V UTP cable or UTP CAT 5 cable, terminated with CAT 5 rated connectors.

NOTE *Extron recommends using the highest quality cable available and affordable, with less than 8 nanoseconds/100 meters of skew (see* Termination of TP cable *in chapter 2). We also recommend the use of pre-terminated and tested cables. Cables terminated on site should be tested before use to ensure that they comply with Category 5 specifications.*

The transmitters and receiver are designed for CAT 5 cable. The system ***can*** *be used with CAT 3 cable, but video performance* ***will be*** *compromised and maximum cable lengths and video resolutions* ***must be*** *decreased.*

Recommended transmission ranges at 60 Hz

Video format	Maximum range
Composite video and audio	800 feet
Component video and S-video	800 feet
640 x 480	500 feet
800 x 600	400 feet
1024 x 768	350 feet
1280 x 1024	300 feet
1600 x 1280	250 feet

NOTE *It is possible to exceed the recommended distances, however, image quality may be reduced.*

About the TP Transmitter/DAs

The Extron IN1124 inputs RGB video and computer audio, converts the input to an output comprising the video and audio, and distributes and transmits four identical proprietary signals over TP cables to up to four IN1130 TP receivers. The IN1128 distributes and transmits eight proprietary signals on TP cables.

Both transmitter models provide a buffered local monitor video output.

Both transmitter models sum the left and right channels of the unbalanced stereo audio input and transmit mono audio on the left and right channels. The transmitters have a local audio output on a 3.5 mm female mini jack connector.

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

About the TP Receiver

The Extron IN1130 TP receiver receives the transmission of one of transmitter's proprietary video and audio signal over a TP cable. The receiver then decodes the received signal and buffers and distributes two identical video outputs on female 15-pin HD connectors. The receiver buffers and distributes two identical mono audio outputs on 3.5 mm mini jacks.

The receiver has a sharpness control that fine tunes the compensation to optimize the video outputs for various cable lengths.

Features

IN1124 TP transmitter/distribution amplifier

Frequency range — Supports 15 kHz to 130 kHz horizontal frequency.

Computer video input — Accepts computer analog video on a 15-pin HD female connector. With an adapter cable, the transmitter can accept Macintosh, 13W3 video, RGBHV, RGBS, RGsB, component video, S-video, or single source composite video input.

Buffered local monitor output — Allows you to view the displayed image on a local monitor.

Audio input — Accepts stereo PC audio on a 3.5 mm stereo mini jack. The transmitter sums the left and right audio channels into two identical mono channels.

RJ-45 connectors — Allows connection to up to four Extron IN1130 TP RGB video receivers.

Mounting — Can be rack mounted with Extron's 1U rack shelf (part #IN9080).

IN1128 TP transmitter/distribution amplifier

Frequency range — Supports 15 kHz to 130 kHz horizontal frequency.

Computer video input — Accepts computer analog video on a 15-pin HD female connector. With an adapter cable, the transmitter can accept Macintosh, 13W3 video, RGBHV, RGBS, RGsB, component video, S-video, or single source composite video input.

Buffered local monitor output — Allows you to view the displayed image on a local monitor.

Audio input — Accepts stereo PC audio on a 3.5 mm stereo mini jack. The transmitter sums the left and right audio channels into two identical mono channels.

RJ-45 connectors — Allows connection to up to eight Extron IN1130 TP RGB video receivers.

Mounting — Can be rack mounted with Extron's 1U rack shelf (part #IN9080).

IN1130 TP receiver

The IN1130 TP receiver has the following features:

Video output — Provides two RGBHV, RGBS, or RGsB outputs on 15-pin HD connectors. With an optional SY-VGA cable, the receiver can output component video, S-video, or composite video.

Audio output — Outputs mono audio on both the tip (left) and the ring (right) of two 3.5 mm stereo mini jacks.

RJ-45 connector — Allows attachment to an Extron IN1124 or IN1128 TP transmitter/DA.

Mounting — Can be mounted to virtually any flat surface with Extron's optional mounting brackets (part #IN9089).

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

Chapter Two

Installation and Operation

Installation Overview

Rack Mounting the Transmitter

Furniture Mounting the Receiver

Transmitter Cabling

Transmitted Signal Cabling

Receiver Cabling

Operation

Troubleshooting

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

CAUTION *Installation and service must be performed by authorized personnel only.*

Installation Overview

To install and set up a TP transmitter/DA and the associated TP receiver(s) for operation, perform the following steps:

1. Disconnect power from all of the equipment, including the video source(s) (such as computers or HDTV set-top boxes), the transmitter, the receivers, and the output display(s).
2. If desired, mount the transmitter in a rack. See *Rack Mounting the Transmitter* in this chapter.
3. If desired, mount the receivers under furniture or to the desired flat surfaces. See *Furniture Mounting the Receiver* in this chapter.
4. Connect the input to the transmitter. See *Transmitter cabling* in this chapter.
5. Connect the local monitor to the transmitter. See *Transmitter cabling* in this chapter.
6. Connect the cables between the transmitter and the TP receivers. See *Transmitted signal cabling* in this chapter.
7. Connect the output cables from the receivers to the displays. See *Output cabling* in this chapter.
8. Connect power supplies to the TP receivers and the TP transmitter. Turn on the video source(s) and the output display(s).
9. On each receiver, as necessary, adjust the sharpness control. See *Operation* in this chapter.

Rack Mounting the Transmitter

The transmitter can be mounted in a 19" equipment rack using an optional Rack-mount shelf (part **#IN9080**) (figure 2-1). The transmitter mounts on the left or right side of the rack.

1. If feet were previously installed on the bottom of the transmitter, remove them.
2. Mount the transmitter on the rack shelf, using the two provided #6-32 x 1/4 screws to secure the receiver to the shelf.

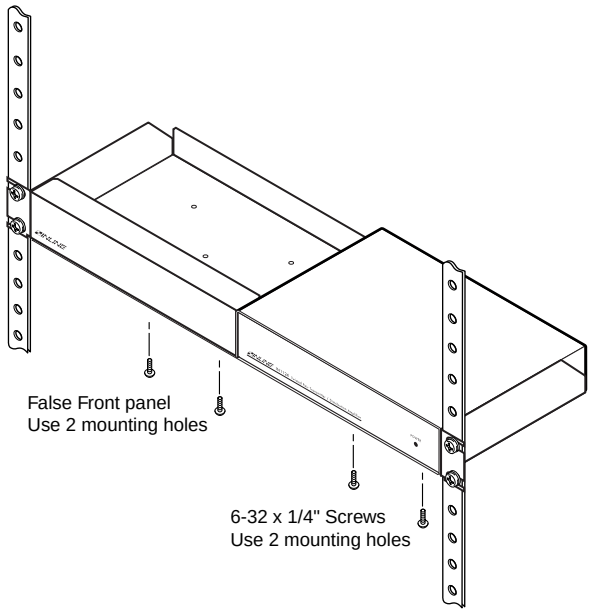


Figure 2-1 — Rack mounting the IN1124

3. Install an optional **IN9088B** blank panel or another unit to the rack shelf.
4. Insert the shelf into the rack, aligning the holes in the shelf with those in the rack.
5. Secure the shelf to the rack.

Furniture Mounting the Receiver

The receiver can be mounted under furniture or to any other flat surface using optional mounting brackets for IN1130 (part **#IN9089**) (figure 2-2).

1. Attach the mounting brackets to the receiver with the machine screws provided.
2. Hold the receiver with the attached brackets against the surface where you want to mount the receiver. Mark the location of the screw holes of the bracket on the mounting surface.
3. Drill pilot holes in the mounting surface at the marked screw locations.
4. Place the receiver against the surface and align the holes in the brackets. Insert screws into the four pilot holes and tighten all four screws to secure the receiver in place.

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

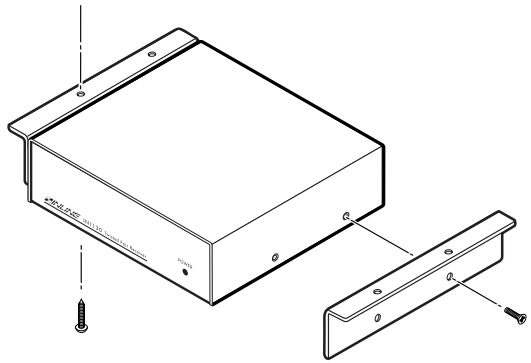
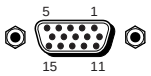


Figure 2-2 — Under-desk or through-desk mounting

Transmitter Cabling

The IN1124 (figure 2-3) and the IN1128 (figure 2-4) accept and transmit computer video and PC audio. These transmitters can also accommodate component video, S-video, or composite video if input on the R, G, and B pins of the 15-pin HD connector using an Extron IN9045-L6 15HD male-to-5 BNC male, 6'cable.

(1) **Video input connector** — Connect computer video to this 15-pin HD female connector.



NOTE *The sense lines on the Input connector are tied directly to the Local Output connector.*

NOTE *Input only sync signals, no video signals, on the sync pins, 13 and 14.*

NOTE *For component video, use the R (R-Y) and R return pins (pins 1 and 6), G (Y) and G return pins (pins 2 and 7), and B (B-Y) and B return pins (pins 3 and 8).*

For S-video, use the R, R return (C-chroma), G, and G return (Y-luma) pins.

For composite video, use the G pin and the associated return pin. For additional video signals, use the R, B, and associated return pins.

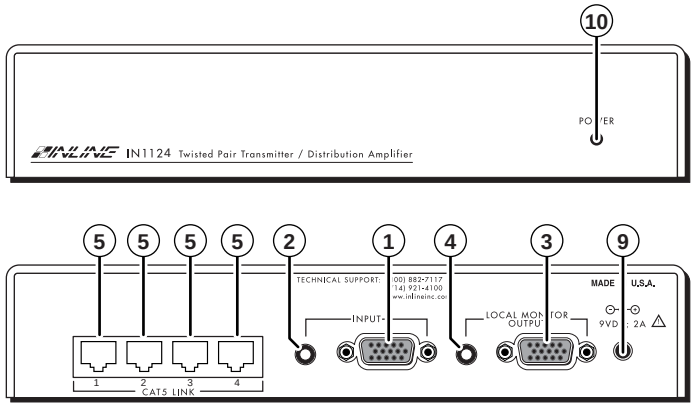


Figure 2-3 — Installation features, IN1124

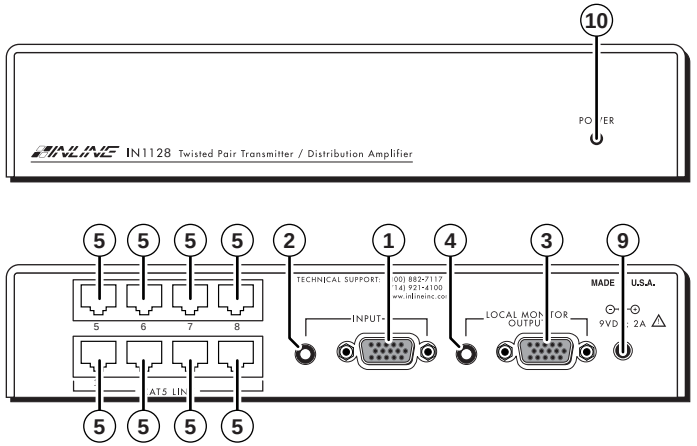


Figure 2-4 — Installation features, IN1128

(2) **Audio input connector** — Connect PC audio to this 3.5 mm, stereo jack. Wire the male plug as shown in figure 2-5.

NOTE *Input only analog, line level, audio signals on the audio input connector.*

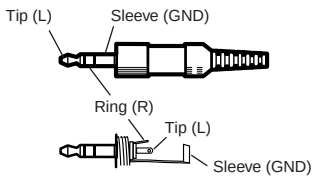
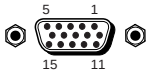


Figure 2-5 — Audio input wiring

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

③ **Local Output connector —** If desired, connect a local monitor video cable to this 15-pin HD female connector.



NOTE *The sense lines on the Local Output connector are tied directly to the Input connector.*

④ **Local audio output connector** — If desired, connect the PC audio output on this 3.5 mm, stereo jack to local powered speakers.

Transmitted Signal Cabling

The **IN1124** (figure 2-3) and **IN1128** (figure 2-4) transmit computer video and PC audio. The **IN1130** (figure 2-6) receives the transmission.

CAUTION *Do not connect these devices to a computer data or telecommunications network*

NOTE *RJ-45 termination must comply with the TIA/EIA T 568A or TIA/EIA T 568B wiring standards for all connections.*

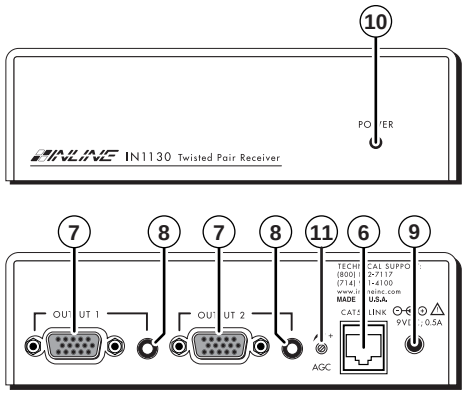


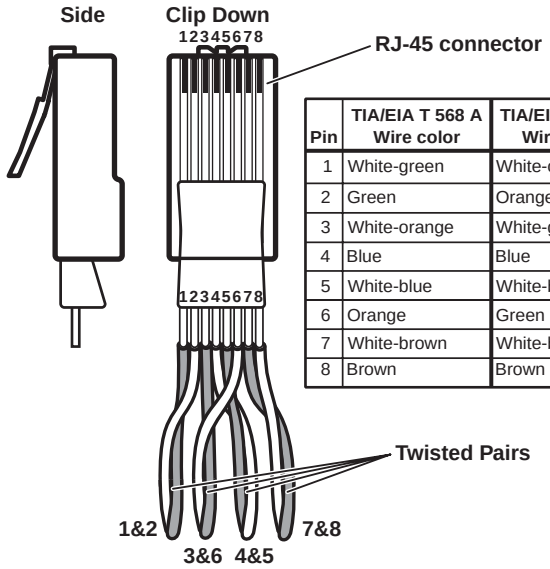
Figure 2-6 — Installation features, IN1130

⑤ **RGB video transmission connector —** Connect one end of a TP cable to each of these RJ-45 female connectors.

⑥ **RGB video reception connector —** Connect the free end of one of the TP cables connected to the transmitter to this RJ-45 connector.

Termination of TP cable

Figure 2-7 details the recommended termination of TP cables in accordance with the TIA/EIA T 568A or TIA/EIA T 568B wiring standards. You can use either standard, but ensure you use the same standard on both ends of the cable.



Pin	TIA/EIA T 568 A Wire color	TIA/EIA T 568 B Wire color	Signal
1	White-green	White-orange	Red/V. sync+
2	Green	Orange	Red/V. sync-
3	White-orange	White-green	Green/H. sync+
4	Blue	Blue	Blue+
5	White-blue	White-blue	Blue-
6	Orange	Green	Green/H. sync-
7	White-brown	White-brown	Mono audio +
8	Brown	Brown	Mono audio -

Figure 2-7 — TP cable termination

Cable testing

To ensure proper cable termination, each transmission cable system that uses CAT 5 cable should be tested (Extron's skew-free UTP cable does not need to be tested). Testing the cable from the RJ-45 connections at the transmitter and receiver gives the most accurate indications of cable problems.

There are two varieties of cable runs: simple runs, in which a single cable is terminated only at the transmitter and receiver, and complex runs, which can include patch bays and multiple terminations and lengths of cable. In either case, the entire cabling system should be tested.

A complete test measures cable length and tests the wire map, attenuation, NEXT, PSNEXT, ELFEXT, PSELFEXT, return loss, ACR and PSACR. All of these tests are critical for digital data transfer, but not for analog video. While all of these tests are important indicators of the quality of the cable termination, the most critical testing parameters for video transfer are wire map (T-568-A or T-568-B termination) and pair length measurements. The largest concern is equalization of skew between cable pairs. Cable systems of 300 feet or less should exhibit no transmission problems if they pass at least CAT 5 channel certification testing.

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

The Microtest OMNI SCANNER 2 performs comprehensive certification testing to the proposed CAT 6 standards. Other manufacturers also make testing equipment. The tests include advanced diagnostics for troubleshooting the cause and location of many cable and termination problems. For simple installation testing, the Microtest MICRO SCANNER PRO tests wire map and cable length, including individual cable pair length.

Equalizing pair skew

The manufacturing process for network (CAT 5) UTP cable leads to a condition called pair skew. For best results, pair skew needs to be equalized when using the CAT 5 cable in A/V applications. The design of Extron's skew-free A/V UTP cable minimizes pair skew to the point that equalization is not required.

Skew exists between pairs when the physical length of one wire pair is different from another. As the transmission cable length increases, the amount of skew increases. Skew affects the displayed image when the differential length between wire pairs exceeds 2 feet, causing the timing of the red, green, and blue video signals to appear out of alignment (horizontal registration errors). A white vertical line on a black field can appear as individual red, green, and blue lines that are close together; the signal transmitted on the shortest wire pair leads the other colors and appears to the left on the display.

UTP cable test equipment measures and reports wire pair length. The report on the various pair lengths can be used in equalizing pair skew. The nominal velocity of propagation (NVP — the speed at which the signal travels on the transmission line, measured as a percentage of the speed of light) of TP cable is very close to that of conventional coaxial cable. The similarity in NVP means that:

- by using an Extron IN9045-L6 15HD male-to-5 BNC male, 6'cable, to adapt the output on a 15-pin HD connector to BNC connectors,
- and then adding an additional length of coax equal to the length of pair skew, placed on the receiver's output,

you can equalize the effects of pair skew (figure 2-8).

If UTP cable test measurement cannot be done, pair skew can still be equalized by viewing a test pattern with a critical eye. Examine the test pattern for loss of horizontal registration and, through a process of trial and error, equalize any pair skew with coax extensions on the red, green, and/or blue outputs.

Extron skew compensation coax cables are available in lengths of 2 through 20 feet, see Appendix A for part numbers.

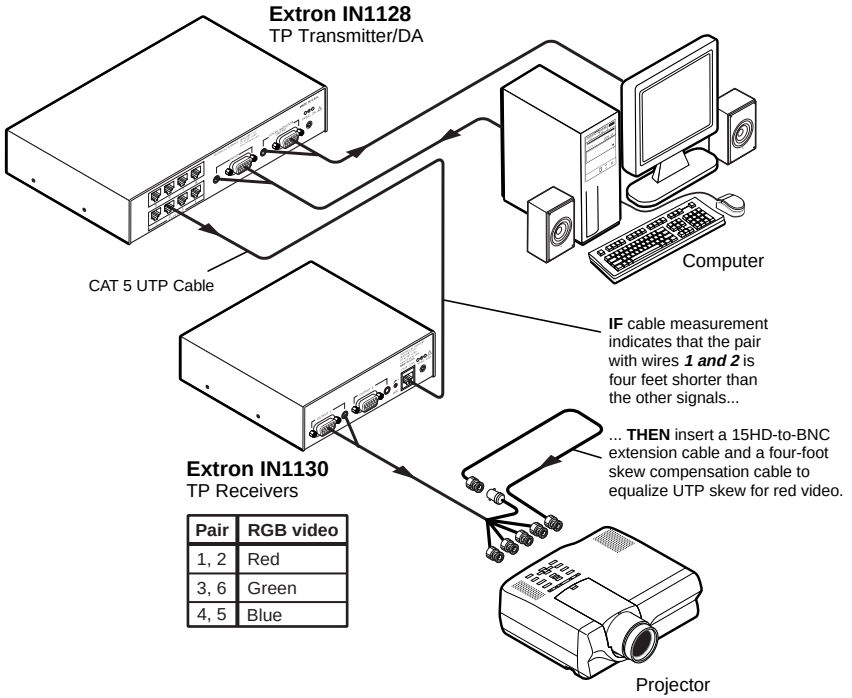
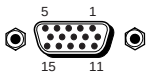


Figure 2-8 — Pair skew equalization

Receiver Cabling

The IN1130 (figure 2-6) outputs two identical sets of RGB video and mono audio. This receiver can also receive component video, S-video, or composite video and output them on the R, G, and B signal lines.

(7) **Output 1 and 2** — Connect the desired video output devices to the rear panel output 15-pin HD connectors.



Outputing component video, S-video, or composite video on the 15-pin HD connectors requires an Extron IN9045-L6 15HD male-to-5 BNC male, 6'cable.

(8) **Audio output 1 and 2** — Connect the mono PC audio output on these 3.5 mm jacks to local powered speakers.

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

Operation

(9) **Power —** Plug the external 9V power supply into this power connector. The power supply is included with the unit. Plug the power supply into a 100 to 240VAC, 50 Hz or 60 Hz power source.

Alternatively, an Extron P/S 100 Universal 12VDC Power Supply can power up to six transmitters or receivers using only one AC power connector.

(10) **Power LED —** Lights to indicate that power is applied.

(11) **Sharpness control** — Adjusts the sharpness of both images simultaneously. Use a Tweeker or other small, flat-head, screwdriver to adjust the control.

Troubleshooting

1. Ensure that all devices are receiving power. The transmitter's and receiver's front panel Power LEDs indicate that they are receiving power.
2. Ensure that the transmitter is receiving a video input.
3. Ensure that the TP cable(s) are properly terminated in accordance with TIA/EIA T 568A or TIA/EIA T 568B standards and that the RJ-45 connections are securely made.
4. The transmission distance may be too short. Ensure that the UTP cable is at least 50 feet long.
5. The transmission distance may be too long. Try shortening the distance between the transmitter and receivers.
6. Call the Extron S³ Sales & Technical Support Hotline if necessary.

Appendix A

Reference Information

Specifications

Included Parts

Accessories

Installation Kits

Cables/Adapters

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

Video

Number/signal type	1, 4 or 8 sets of proprietary analog signals
Connectors	1, 4 or 8 RJ-45 female

Video input

Number/signal type	
IN1124, IN1128	1 analog VGA-UXGA RGBHV, RGBS, RGsB and 1 **unbuffered local monitor output** of analog VGA-UXGA RGBHV, RGBS, RGsB
IN1130	1 set of proprietary analog signals
Connectors	
IN1124, IN128	1 female 15-pin HD for input 1 female 15-pin HD for unbuffered local monitor loop-through (Mac and Sun/SGI to VGA adapters are available)
IN1130	1 shielded female RJ-45
Nominal level	0.7V p-p for RGB
Minimum/maximum levels	Analog: 0.3V to 1.5V p-p with no offset at unity gain
Impedance	75 ohms
Horizontal frequency	15 kHz to 130 kHz
Vertical frequency	30 Hz to 150 Hz

Video output

Number/signal type	
IN1124	4 sets of proprietary analog signals
IN1128	8 sets of proprietary analog signals
IN1130	2 analog RGBHV, RGBS, RGsB
Connectors	
IN1124	4 shielded female RJ-45
IN1128	8 shielded female RJ-45
IN1130	2 female 15-pin HD
Nominal level	0.7V p-p for RGB
Minimum/maximum levels	0.3V to 1.5V p-p
Impedance	75 ohms

Sync

Input type	RGBHV, RGBS, RGsB
Output type	RGBHV, RGBS, RGsB
Input level	2.0V to 5.5V p-p
Output level	4.0V to 5.0V p-p TTL: 5.0V p-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohms
Max. propagation delay	48 ns
Max. rise/fall time	3.5 ns

Audio — audio models only

Number/signal type	4 or 8 sets of analog proprietary signals
Connectors	4 or 8 RJ-45 female
Frequency response	20 Hz to 20 kHz, ±0.05dB
THD + Noise	0.3% @ 1 kHz at nominal level
S/N	>68dB at rated maximum output
Crosstalk	<-80dB @ 1 kHz
Stereo channel separation	>80dB @ 1 kHz
CMRR	>33dB @ 20 Hz to 20 kHz

Audio input

Number/signal type	
IN1124, IN1128	1 stereo, unbalanced, and 1 local output
IN1130	1 set of proprietary analog signals
Connectors	
IN1124, IN1128	(1) 3.5 mm mini stereo jack (1) 3.5 mm mini stereo jack (for unbuffered local output)
IN1130	1 shielded RJ-45 female
Impedance	>5 kohms unbalanced, DC coupled
Nominal level	-10dBV (316mV)
Maximum level	+5.5dBu, (unbalanced) at 1%THD+N

Audio output

Number/signal type	
IN1124	4 sets of proprietary analog signals
IN 1128	8 sets of proprietary analog signals
IN1130	2 mono, unbalanced
Connectors	
IN1124	4 shielded RJ-45 female
IN1128	8 shielded RJ-45 female
IN1130	(2) 3.5 mm mini jacks
Impedance	5 kohms unbalanced, 10 kohms balanced
Nominal level	-10dBV (316mV)

NOTE *0dBu = 0.775 volts (RMS).*

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

General

Power	100VAC to 240VAC, 50/60 Hz, 15 watts, external, autoswitchable
IN1124, IN1128	External 9VDC, 2.0A power supply. Product requires 1.6 A.
IN1130	External 9VDC, 0.5A power supply. Product requires 0.45 A.
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount	
IN1124, IN1128	Yes, with optional 1U rack shelf, part #IN9080
IN1130	No, but furniture or other flat surface mountable with optional #IN9089 mounting brackets
Enclosure type	Metal
Enclosure dimensions	
IN1124, IN1128	1.7" H x 8.5" W x 6.0" D (1U high, half rack width) 4.2 cm H x 21.6 cm W x 14.7 cm D (Depth excludes connectors.)
IN1130	1.7" H x 5.6" W x 3.75" D (1U high) (4.3 cm H x 14.2 cm W x 9.5 cm D) (Depth excludes connectors.)
Product weight	
IN1124	1.0 lb (0.5 kg)
IN1128	1.5 lb (0.7 kg)
IN1130	0.7 lb (0.3 kg)
Shipping weight	
IN1124	3 lbs (1.4 kg)
IN1128	4 lbs (1.8 kg)
IN1130	2 lbs (0.9 kg)
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Listings	ETL (UL1950)
Compliances	CE
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *Specifications are subject to change without notice.*

Included Parts

These items are included in each order for a specific TP transmitter or receiver:

	Included parts	Replacement part number
	IN1124	
	Twisted pair transmitter/DA for high-resolution video and audio	IN1124-2
	IN1124/28/30 Transmission System User's Guide	
	9.0VDC, 120VAC 60Hz, 2.0A external power supply	IN9211-1
-or-	9.0VDC, 230VAC 50 Hz, 2.0A external power supply	IN9211-5
	Adjustment tool with technician's blade	IN9339
	IN1128	
	Twisted pair transmitter/DA for high-resolution video and audio	IN1128-2
	IN1124/28/30 Transmission System User's Guide	
	9.0VDC, 120VAC 60Hz, 2.0A external power supply	IN9211-1
-or-	9.0VDC, 230VAC 50 Hz, 2.0A external power supply	IN9211-5
	Adjustment tool with technician's blade	IN9339
	IN1130	
	Twisted pair receiver/DA for high-resolution video and audio	IN1130-2
	IN1124/28/30 Transmission System User's Guide	
	9.0VDC, 120VAC 60Hz, 0.5A external power supply	IN9204-1
-or-	9.0VDC, 230VAC 50 Hz, 0.5A external power supply	IN9204-2
	Adjustment tool with technician's blade	IN9339

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

Suggested Accessories

Accessory	Part number
P/S 100 Multiple output 12V power supply	60-357-01
1U rack-mount shelf (for IN1124, IN1128)	IN9080
Rack-mount shelf blank panel (for IN1124, IN1128)	IN9088B
Mounting brackets (for IN1130)	IN9089

Cables/Adapters

15HD-terminated cable	Part number
15HD male-to-male, 6′	IN8006M
15HD male-to-male, 12′	IN8012M
15HD male-to-male, 25′	IN8025M
15HD male-to-male, 35-240″	IN80xxM
15HD male-to-female, 6′	IN8006
15HD male-to-female, 12′	IN8012
15HD male-to-female, 25′	IN8025
15HD male-to-female, 35-240″	IN80xx

15HD-5BNC adapter cable	Part number
15HD male-to-5 BNC male, 6′	IN9045-L6
15HD male-to-5 BNC male, 12′	IN9045-L12
15HD male-to-5 BNC male, 25′	IN9045-L25
15HD male-to-5 BNC male, 35′	IN9045-L50
15HD male-to-5 BNC male, 50′	IN9045-L50

Plenum 15HD-5BNC adapter cable	Part number
15HD male-to-5 BNC male, plenum, 25′	IN9045FP-L25
15HD male-to-5 BNC male, plenum, 35′	IN9045FP-L50
15HD male-to-5 BNC male, plenum, 50′	IN9045-L50
15HD male-to-5 BNC male, plenum, 75′	IN9045LP-L75

Skew-free A/V cable	Part number

NOTE *Skew-Free A/V UTP cables are not recommended for Ethernet/LAN applications.*

3′ Skew-free A/V UTP	26-569-01
6′ Skew-free A/V UTP	26-569-02
12′ Skew-free A/V UTP	26-569-03
25′ Skew-free A/V UTP	26-569-04
35′ Skew-free A/V UTP	26-569-05
50′ Skew-free A/V UTP	26-569-06
75′ Skew-free A/V UTP	26-569-07
100′ Skew-free A/V UTP	26-569-08
150′ Skew-free A/V UTP	26-569-09
200′ Skew-free A/V UTP	26-569-10
250′ Skew-free A/V UTP	26-569-11
300′ Skew-free A/V UTP	26-569-12
25′ Skew-free Plenum	26-570-04
35′ Skew-free Plenum	26-570-05
50′ Skew-free Plenum	26-570-06
75′ Skew-free Plenum	26-570-07
100′ Skew-free Plenum	26-570-08

Skew-free A/V cable	Part number
150′ Skew-free Plenum	26-570-09
200′ Skew-free Plenum	26-570-10
250′ Skew-free Plenum	26-570-11
300′ Skew-free Plenum	26-570-12

Bulk cable	Part number
Skew-free A/V UTP 1000′ (Bulk) (non-plenum)	22-141-03
Skew-free A/V UTP 1000′ (Bulk) (plenum)	22-142-03

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de

im Vertrieb von CAMBOARD Electronics

RJ-45 connector	Part number
CAT 6 jack (black)	10-463-10
CAT 6 jack (red)	10-463-11
CAT 6 jack (blue)	10-463-12
CAT 6 jack (orange)	10-463-13
CAT 6 jack (grey)	10-463-14
CAT 6 jack (white)	10-463-15
CAT 6 jack (ivory)	10-463-16

Skew compensation cable	Part number
2′ skew cable (red, green, blue)	26-524, 525, 526-01
4′ skew cable (red, green, blue)	26-524, 525, 526-02
6′ skew cable (red, green, blue)	26-524, 525, 526-03
8′ skew cable (red, green, blue)	26-524, 525, 526-04
10′ skew cable (red, green, blue)	26-524, 525, 526-05
12′ skew cable (red, green, blue)	26-524, 525, 526-06
14′ skew cable (red, green, blue)	26-524, 525, 526-07
16′ skew cable (red, green, blue)	26-524, 525, 526-08
18′ skew cable (red, green, blue)	26-524, 525, 526-09
20′ skew cable (red, green, blue)	26-524, 525, 526-10

Assorted cables and adapters	Part number
SVHS 6′ (6 feet/1.8 meters)	26-316-02
SVHSM - BNCF	26-353-01
SVHSM - BNCM-3′	26-353-03

www.camboard.de Tel. 07131 911201 Fax 07131 911203 ce-info@camboard.de